

Final Report
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**TROPOSPHERIC DIAGNOSTIC MODELING STUDIES OF PEM-TROPICS FIELD
DATA: INVESTIGATION OF THE HO_x/NO_x/O₃ PHOTOCHEMICAL SYSTEM AND
ITS COUPLING TO SULFUR AND HALOGEN CHEMISTRY**

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September, 1996, J. Hoell, D. Davis, D. Jacobs, M. Rodgers, R. Newell, H. Fuelberg, R. McNeal, and R. Bendura, **J. Geophys. Res.**, **104**, 5567, 1999.

6) Assessment of Upper Tropospheric HO_x Sources Over the Tropical Pacific Based on NASA GTE/PEM Data: Net Effect on HO_x and Other Photochemical Parameters,

Crawford, J., D. Davis, J. Olson, G. Chen, S. Liu, G. Gregory, J. Barrick, G. Sachse, S. Sandholm, B. Heikes, H. Singh, and D. Blake, **J. Geophys. Res.**, in Press, 1999.

7) Tropospheric vertical transport over the tropical Pacific, S. Liu, S. McKeen, E.Y. Hsie, X. Lin, D. Blake, F. Rowland, A. Bandy, D. Thornton, E. Browell, R. Newell, S. Smyth, and D. Davis, **J. Geophys. Res.**, In press

8) An Assessment of HO_x Chemistry in the Tropical Pacific Boundary Layer: Comparison of Observations With Model Simulations During PEM Tropics A Chen, G., D. Davis, J. Crawford, B. Heikes, D. O'Sullivan, F. Eisele, L. Mauldin, D. Tanner, J. Collins, J. Barrick, B. Anderson, D. Blake, J. Bradshaw, S. Sandholm, M. Carroll, G. Albercook, and A. Clarke,, **J. Atmos. Chem.**, Submitted, 1999.

9) Observed Distributions of Nitrogen Oxides in the Remote Free Troposphere, J. Bradshaw, S. Smyth, S. Liu, G. Grodzinsky, R. Newell, and D. Davis, **J. Physical Reviews**, Accepted.

10) The Influence of Oceanic DMS Emissions to SO₂ Levels In the Remote Marine Boundary Layer During PEM-Tropics A ,G. Grodzinsky, D. Davis, G. Chen, Z. Shon, A. Bandy, D. Thornton, and D. Blake, **J. Atm. Envir.** Submitted.

Over the time period of this NASA grant the PI has helped plan and execute in the PEM-Tropics A field program. He has also helped organize and co-chair three data workshops which have focused on the detailed analysis of PEM-Tropics A data. His direct participation in these analyses has led to his major involvement in 10 manuscripts, 5 of which are in print, 3 in press, and 2 submitted. A complete list of papers is given below:

- 1) Photofragmentation Two-Photon Laser-Induced Fluorescence Detection of NO₂ and NO: Comparison of Measurements with Model Results Based on Airborne Observations During PEM-Tropics A, J. Bradshaw, D. Davis, J. Crawford,, G. Chen, S. Sandholm, R. Shetter, G. Gregory, G. Sachse, and B. Heikes, **Geophys. Res. Lett.**, **26**, 471-474, 1999.
- 2) DMS oxidation in the equatorial Pacific: Comparison of model simulations with field observations for DMS, SO₂, H₂SO₄(g), MSA(g), MS, and NSS, D. Davis, G. Chen, F. Eisele, B. Huebert, D. Tanner, L. Mauldin, A. Bandy, D. Thornton, and D. Lenschow, **J. Geophys. Res.**, **104**, 5765, 1999.
- 3) An Assessment of Cloud Effects on Photolysis Rate Coefficients: Comparison of Experimental and Theoretical Values, Crawford, J., D. Davis, G. Chen, R. Shetter, M. Müller, J. Barrick, J. Olson, **J. Geophys. Res.**, **104**, 5725, 1999.
- 4) Particle Nucleation in the Tropical Boundary Layer and its Coupling to Marine Sulfur Sources, A. D. Clarke, D. D. Davis, V. Kapustin, F. Eisele, G. Chen, I. Paluch, D. Lenschow, A. R. Bandy, D. Thornton, K. Moore, L. Mauldin, M. Litchy, M. Carroll, J. Collins, and G. Abercoock, **Science**, **282**, 89, 1998.
- 5)The Pacific Exploratory Mission in the Tropical Pacific: PEM-Tropics A, August-